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RESEARCH ON CANADA'S ARCTIC

An address by Dr. O. M. Solandt,
Vice-President, Research and Development, Canadian National Railways,
at a dinner on board the SS "Homeric" in Montreal Harbour,
in honour of the Arctic Institute of North America,
October 26th, 1961.

(*H1) Solandt

After such an excellent dinner and a fascinating story of undersea exploration, I am certain that you are prepared to think well of both the Home Lines and the United States Navy. I now have the relatively simple task of seeking to make you think equally well of Arctic research in general and of the Arctic Institute of North America in particular, in honour of which tonight's dinner has been given. I only wish that I were better equipped with knowledge, wisdom, and experience for this task. I must confess to you that I am a compromise. The Arctic Institute feels that its past accomplishments and present capabilities are far too little known to Canadians and especially to Canadians in industry. In selecting someone to talk about the Institute and its role in Arctic research, the committee who were planning the dinner had a choice between several authentic long-haired scientists with vast experience of Arctic research on the one hand, and a few prominent and presumably bald-headed industrialists with faith in the importance of Arctic research on the other hand. This was a difficult choice and so the typical Canadian compromise was to select a short-haired scientist who works in industry and has a tourist's knowledge of the North, together with a keen interest in Arctic and Antarctic research. All that was then required was a simple twist of the arm and here I am.

The first question that any businessman should ask when exposed to a talk on Arctic research is: "What is Arctic research and why do it at all?" I firmly believe that exploration of previously unknown territory should be classed as research. Consequently, research in the Canadian Arctic can be said to have begun with the explorations of Frobisher and Davis in the 16th century. This phase reached a peak in the 19th century with the explorations of Franklin and those who searched for him. Following a lapse of interest of almost fifty years, active exploration was renewed in the 20th century and was greatly simplified by the advent of the aeroplane, the icebreaker and more recently the nuclear submarine. While the main tasks of exploration in the Arctic are now over, there is still much that remains to be done. Most of this will undoubtedly be encompassed in the extensive programmes of topographic and geological mapping planned by the Department of Mines and Technical Surveys. Research in the Arctic is now well past this stage of simple exploration and is entering a period of detailed scientific investigation of the physical, biological and social problems of the Arctic environment. Much still remains to be discovered concerning the meteorology, geology, oceanography and glaciology of the polar regions. In addition we still

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know far too little about the plant and animal life of Arctic land and sea, of the Eskimo and his history, his culture and his marvellous adaptation to his environment, and of the problems of white men living in the North. Our hypothetical skeptical businessman might then say: "These are undoubtedly interesting problems but why bother to find answers to them when we have such pressing problems in other parts of Canada?"

It seems to me that there are many good reasons for finding out more about the Arctic. Among the more important are:

First, the satisfying of man's natural curiosity about the unknown. This has been the driving force for many explorers but is less often recognized as the motivating force in much modern scientific research. This urge to see what is over the next hill or around the next corner, whether in exploration or in laboratory research, has led to most of man's important extensions of knowledge and we would be foolish to try to supress it. This pursuit of knowledge in the Arctic is important not only to the Arctic area itself but also to science in general. There are some very basic questions about the earth as a whole that require information that can only be obtained in the polar regions before answers can be given. For instance, the structure of continents and oceans, problems of the ionosphere, the heat balance of the atmosphere, and so on.

Second, a desire to know more about the natural resources of the North and of how they could be exploited so that when increasing demands make their exploitation economically reasonable, we will be in a sound position to develop these resources skillfully and profitably.

Thirdly, there is still much to be discovered about the Arctic environment, both for normal development of natural resources and for defence purposes. This includes the vast seas under the Arctic ice of which you have heard tonight, the terrain and ice conditions of the Arctic, a better knowledge of Arctic weather and the special magnetic and radio problems encountered in polar regions. In addition, many of the apparently simple problems of living, travelling and building in the Arctic have not yet been satisfactorily solved and still require research and development.

And finally, we in Canada have a special selfish reason for taking a very active interest in our Arctic territories - in order to make sure that no other power will question our title to this domain. Most of the world is friendly toward Canada and there is little likelihood that our claims to these territories will be disputed, provided we continue to

take an active interest in them. Should we fail to show this interest, others might well seek to fill this gap.

Next, a word about the Arctic Institute of North America itself. The Arctic Institute is a private, non-profit organization founded in 1945 and by 1946 had been legally incorporated both in the United States and in Canada. It began as the result of a strongly held conviction among scientists and others in the United States and Canada that the great advance in Arctic knowledge started during the war should not be allowed to stop, and that there was a growing need for a privately organized scientific body whose object was the furthering of basic research in the natural and social sciences. During the years since 1945 the Institute has grown in stature and in achievement. More than five hundred field parties have been supported over the years. These have included two major expeditions to Baffin Island in 1950 and 1953 under the leadership of Pat Baird, who is in the audience tonight, and an expedition now wintering on Devon Island led by Spencer Apollonio. In addition, the Institute has been active with advice, equipment, loans and logistic aid to many other parties. Extensive research programmes have been undertaken for private companies and for government on a contract basis. The Institute's polar library rates among the world's top four. Its collection of material is accessible throughout the Continent via the inter-library loan system. An Arctic bibliography has been published in ten volumes, providing cross-indexed abstracts from almost 63,000 publications. In addition, the Institute publishes the journal "Arctic" which appears quarterly and goes to 2,500 associates scattered throughout the world.

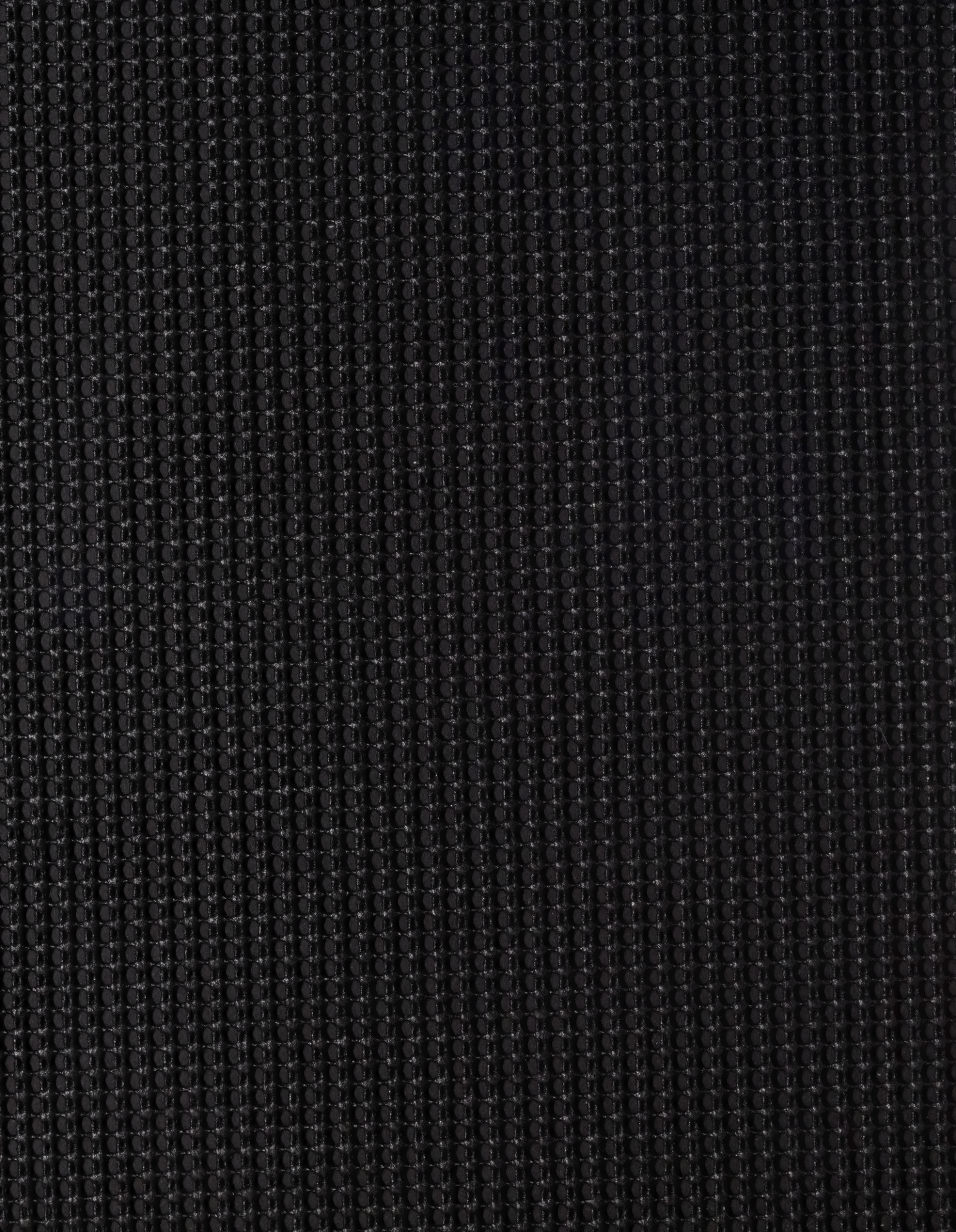
The Institute was founded in 1945 with the initial financial assistance of the National Research Councils of Canada and the United States, the Carnegie Corporation of New York, and the Hudson's Bay Company whose representatives we are happy to welcome here tonight. From the beginning it has found its principal home, both physically and spiritually, at McGill University. Since then it has received substantial support from the National Science Foundation, the Office of Naval Research, the Army and the Air Force in the United States; and from the Sir Frederick Banting Fund, the National Research Council, the Defence Research Board and the Department of Northern Affairs and National Resources in Canada. In addition, funds have been received from private individuals, industries and foundations in both countries, and the work has been supported by fellows and members of the Institute.

Until 1958 the work of the Institute was limited to the Arctic, even though the interests of its staff and members encompassed the Antarctic as well. Because of the need for helping in co-ordination of research in the Antarctic as well as in the Arctic during the International Geophysical Year, the Institute formally broadened its interests in order to

encompass Antarctic research and since then has done an increasing amount of work in the Antarctic, mainly for various United States agencies.

At this point the critical businessman might well ask: "Why have a private non-profit organization like the Arctic Institute working in this field? Why not leave everything to government initiative?" A complete and logical answer to this question would take more time than is available. Briefly, the answer is along these lines. If research in any particular field is to be healthy, there must be a complete continuity of research from the most fundamental to the most applied. Experience in many fields of research has shown that this close-knit community can only be developed when there is close co-operation between the universities, the government and industry. The unique role of the Arctic Institute is to act as a catalyst in bringing about this essential co-operation. The Arctic Institute acts as a repository not only for scientific information in its library, but also for details of the programmes of polar research of governmental, industrial and academic research agencies. It also has an extensive knowledge of where to find individuals with Arctic or Antarctic experience and "know-how". One of the principal tasks of the Arctic Institute is to seek out promising students and interest them in Arctic problems through grants in aid of specific research projects or by recruiting them for larger expeditions. In this way the Institute helps to create and to maintain a reservoir of skilled scientists for work in the Arctic. In addition, the Institute is able to foster and look after small expeditions and new experiments in research in a detailed and understanding way that is difficult for the government departments with their large and systematic programmes.

I feel too that we in Canada are very fortunate that the Arctic Institute was founded as the Arctic Institute of North America. The Institute serves as an ideal meeting ground for U.S. and Canadian scientists with common interests in the Arctic and has made it possible for Canada to reap substantial benefits from U.S. work in the Arctic without the complications that sometimes surround such international arrangements. In addition, the Arctic Institute gives Canada access to extensive and valuable U.S. work in the Antarctic, much of which can be directly applied in our own Arctic. During the more than fifteen years that the Institute has operated, the benefits from its activities have been freely shared between Canada and the United States. There is no doubt that Canada has, because of her widespread Arctic possessions, benefited more than the United States from the work. In spite of this, the United States government and other agencies have been generous in their support and have given more than have the corresponding Canadian agencies. It is certainly to be hoped that Canada will in the future contribute more toward the cost of the Institute's programme. It is



unfortunately true also that a surprisingly small percentage of the people who have actually done original research or exploration in the Canadian Arctic are Canadians. It is strange indeed that the sense of adventure that sends young men to the Arctic seems to be more highly developed in Europe, in the British Isles and in the older parts of the United States than in Canada itself. Possibly as the frontier recedes from our cities, more young Canadians will seek adventure in the Arctic.

We are now entering a new phase in the development of the Canadian Arctic. Barring a total atomic war, the prospect is one of a slow and steady growth in the economic importance of the Arctic. As a student of the problems of transportation, I have no illusions about the difficulties that stand in the way of the development of natural resources in the Arctic, but I am sure the time will come when they can be used economically and will be needed to support a growing world population. Now is the time to undertake the widespread basic research that will be needed as a foundation for this development. The federal government has a magnificent and highly organized research programme planned to meet the need for systematic exploration and mapping of these resources. Nonetheless, there is a great need for increased government, private and industrial support to the Arctic Institute of North America so that it can carry on a comprehensive series of investigations in many scientific disciplines that will not only complement the larger government programmes, but will also help to interest a proportion of our best young university graduates in the problems of the North and train them in the techniques of polar research.

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